FLWEMS Paramedics Adult Protocol for the Management of:
NERVE AGENT EXPOSURE

Summary of Changes
Changes to this protocol came as a result of deficiency findings during the September 2003 Chemical Surety Tiger Team Inspection). Changes to this protocol include:

- *Treating systemic rebound hypertension as a result of the administration of Protopam Chloride*
- *Clarification for the administration of Protopam Chloride in the event that MARK I kits are unavailable*
- *Initial dose of Diazepam for nerve agent induced seizures changed from 5-10mg IVP to 10mg IVP*

Indications
To outline the paramedic care and management for patient(s) experiencing signs & symptoms of nerve agent exposure. This protocol is intended for the treatment of GB (Sarin) and VX nerve agents specifically.

Specific Reference
DA Pam 50-6
Textbook of Military Medicine, Part I – Medical Concepts of the Chemical & Biological Warfare
USAMRICD, Medical Management of Chemical Casualties Handbook, Third Edition

Special Considerations
Paramedics ***ARE NOT*** expected to perform patient rescue from a contaminated environment ***OR*** initial decontamination of patients.

Procedure

1. Assure personal safety by donning all required Personal Protective Equipment to include:

   a. Air-purifying or atmosphere-supplying respirators, i.e. Self-Contained Breathing Apparatus or M-40 protective mask.

   b. Dermal protective ensemble covering exposed skin, i.e. MOPP gear, Hazardous Material/Chemical (HAZMAT) suit with protective hood, butyl rubber gloves and Hazardous Material/Chemical (HAZMAT) over-boots. Whenever possible, areas of known liquid contamination should be decontaminated prior to patient handling to minimize exposure risk.

2. Remove patient from area of exposure. Patients should be evacuated to an upwind location. When possible, for unmasked casualties who are unconscious or otherwise incapacitated, mask the casualty before evacuating. This is unnecessary after the casualty has been decontaminated in the field and is in a clear environment.

   a. Vapor-exposed nerve agent casualties should be decontaminated by removing all clothing in a clean air environment and shampooing or rinsing the hair to prevent vapor off-gassing.

   b. Liquid-exposed nerve agent casualties should be decontaminated by –

      (1) If warm/hot water is available, washing in warm or hot water at least three times. Use liquid soap (dispose of container after use and replace), copious amounts of water, and mild to moderate friction with a single-use sponge or washcloth in the first and second washes. Scrubbing of exposed skin with a brush is discouraged, because skin damage may occur and may increase absorption. The third wash should be a rinse with copious amounts of warm or hot water. Shampoo can be used to wash the hair. The rapid physical removal of a chemical agent is essential. If warm or hot water is not available, but cold water is, use cold water. Do not delay decontamination to obtain warm water.

(2) Rinsing the eyes, mucous membranes, or open wounds with sterile saline or water. The healthcare provider should—

(a) Check the casualty after the three washes to verify adequate decontamination (i.e. less than 1 WPL--the workplace airborne exposure limit) before allowing entry to the treatment area within the military or contractor-operated medical treatment facility. This may be done using a low level air-monitoring device such as ACAMS, ICAMS or MINICAMS to detect any evidence of vapor off-gassing. If the washes were inadequate, repeat the entire process.

3. If the scene is a possible crime scene, DO NOT disturb the scene as much as possible. However, it is more important to provide appropriate patient care.

4. Triage all patients.

5. Assure that all patients have been decontaminated prior to evaluation.

6. Secure an airway as outlined in FLWEMS Paramedics Adult Protocol for the Management of Airway & Ventilation and administer supplemental **Oxygen** as needed..

7. Determine the severity of exposure and treat as follows:

Mild Exposure
Vapor exposure: Miosis; rhinorrhea; slight bronchoconstriction; secretions (slight dyspnea). Dermal exposure: Effect may be rapid in onset after an asymptomatic interval of up to 18 hours. Increased sweating at the site and/or muscular fasciculations at the site of exposure.

1. If patient is experiencing nerve agent/organophosphate symptoms other than miosis, administer one **MARK I** (NAAK) kit.

2. Establish IV of **0.9% NaCL**.

3. If **MARK I** (NAAK) kit is not readily available, administer **Atropine Sulfate** 2mg IV. May repeat this dose every five to ten minutes until secretions have subsided.

4. Administer **Protopam Chloride** (2PAM Cl.) 1-1.5 Gram IV infusion over 20-30 minutes. *PREPARATION*: Reconstitute **Protopam Chloride** (2PAM Cl.) in 20cc of **Sterile Water**, then add to 100cc bag of **0.9% NaCL**.

5. When administering **Protopam Chloride** (2PAM Cl.) paramedics should be aware of possible rebound hypertension. In the event that patients experience symptomatic hypertension as a result of receiving **Protopam Chloride**, paramedics should consider **Phentolamine Mesylate** (Regitine) 5mg IV push or IM, may repeat × 1 as needed.

6. If signs/symptoms of nerve agent persist or patient condition deteriorates, treat for moderate to severe exposures.

Moderate to Severe Exposures
Moderate exposure: (Vapor) Miosis; rhinorrhea; slight bronchoconstriction; secretions (moderate to marked dyspnea. (Dermal) Effect may be precipitant in onset after an asymptomatic interval of up to 18 hours. Same as for mild exposure, plus: vomiting, diarrhea and/or generalized weakness.

Severe exposure: (Vapor) Same as for moderate exposure, plus: loss of consciousness; convulsions (seizures); generalized fasciculations; flaccid paralysis; apnea; involuntary micturition/defecation possible with seizure. (Dermal) Effect may be precipitant in onset after a 2-30 minute asymptomatic interval. Same as for moderate exposure, plus: Loss of consciousness, convulsions (seizures), generalized fasciculations, flaccid paralysis, apnea, generalized secretions and/or involuntary micturition/defecation possible with seizures.

FLWEMS Paramedics Adult Protocol for the Management of:
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1. If available, administer **MARK I** (NAAK) kit times 3 as soon as possible.

2. Establish IV of **0.9% NaCL**.

3. If **MARK I** (NAAK) kit is not readily available, administer **Atropine Sulfate** 2mg IV. May repeat this dose every three to five minutes until secretions have subsided.

4. If **MARK I** (NAAK) kit is not readily available, administer **Protopam Chloride** (2PAM Cl.) 1-1.5 Gram IV infusion over 20-30 minutes.

    a. Reconstitute **Protopam Chloride** (2PAM Cl.) in 20cc of **Sterile Water.**

    b. Then add to 100cc bag of **0.9% NaCL**.

5. When administering **Protopam Chloride** (2PAM Cl.) paramedics should be aware of possible rebound hypertension. In the event that patients experience symptomatic hypertension as a result of receiving **Protopam Chloride**, paramedics should consider **Phentolamine Mesylate** (Regitine) 5mg IV push or IM, may repeat × 1 as needed.

6. Administer **CANA** kits (If available) immediately after administering **MARK I** kits.

7. If **CANA** kits are not available, administer **Diazepam** (Valium) 10 mg IVP or IM.

8. Monitor cardiac activity, oxygen saturation, and blood pressure. Treat dysrhythmias per ACLS protocols.

9. Treat any other trauma/injuries per Multi-System Trauma protocol.

10. Transport to appropriate Emergency Department.

11. Contact medical control for further orders as needed.

Supportive Care
Moderate to severe nerve agent exposures are unlikely to occur except in the setting of laboratory accidents, storage disposal, remediation sites or after terrorist attacks. Under these conditions, other conventional injuries may be superimposed upon the nerve agent exposure. The priorities for emergency medical treatment of mixed conventional-nerve agent casualties should be based upon traditional priorities established for advanced cardiac life support and advanced trauma life support. Primacy should always be given to maintaining airway, breathing and circulation. Other injuries or illnesses uncovered during the secondary survey should be treated with available resources after resuscitative care has been rendered. Fluid and electrolyte requirements are usually minimal, unless superimposed burns or blood loss cause a decrease in cardiac output. Head trauma may be difficult to assess when seen in association with the altered levels of consciousness and pupillary changes of a severe nerve agent vapor exposure and may require early neurosurgical consultation. *Torsades de pointes*, a rapid, multi-focal ventricular arrhythmia, has been reported in humans following organophosphorus-pesticide intoxication and may require immediate treatment following the latest advanced cardiac life support guidelines.

Triage Considerations
Refer to S.T.A.R.T. Triage Protocol

END OF SOP – NOTHING FOLLOWS